

CLAIMS

1. A prophylactic or therapeutic method for a disease associated with decreased expression of AOP-1 gene or AOP-1, comprising (1) transfecting a nucleic acid encoding AOP-1 or a nucleic acid encoding a polypeptide having an addition, deletion or substitution of one or more amino acids as compared with the amino acid sequence of AOP-1 while retaining the function of AOP-1, or (2) administering a material enhancing the expression of AOP-1 gene, a material enhancing the production of AOP-1 or a material enhancing the function of AOP-1.
2. The prophylactic or therapeutic method of claim 1, further comprising transfecting a nucleic acid encoding AOP-1 or a nucleic acid encoding a polypeptide having an addition, deletion or substitution of one or more amino acids as compared with the amino acid sequence of AOP-1 while retaining the function of AOP-1 into cells of an affected tissue.
3. The prophylactic or therapeutic method of claim 1, further comprising administering a material enhancing the expression of AOP-1 gene.
4. The prophylactic or therapeutic method of claim 1, further comprising administering a material enhancing the production of AOP-1.
5. The prophylactic or therapeutic method of claim 4, wherein the material enhancing the production of AOP-1 is a nucleic acid encoding AOP-1 or a nucleic acid encoding a polypeptide having an addition, deletion or substitution of one or more amino acids as compared with the amino acid sequence of AOP-1 while retaining the function of AOP-1.
6. The prophylactic or therapeutic method of claim 1, further comprising administering a material enhancing the function of AOP-1.
7. The prophylactic or therapeutic method of claim 1, wherein the disease associated

with decreased expression of AOP-1 gene or AOP-1 comprises chronic heart failure, ischemic heart failure, ischemic heart disease, rheumatoid arthritis, neurodegenerative disease, hepatic disease or renal failure.

8. A prophylactic or therapeutic agent for a disease associated with decreased expression of AOP-1 gene or AOP-1, comprising as an active ingredient (1) a nucleic acid encoding AOP-1 or a nucleic acid encoding a polypeptide having an addition, deletion or substitution of one or more amino acids as compared with the amino acid sequence of AOP-1 while retaining the function of AOP-1, or (2) a material enhancing the expression of AOP-1 gene, a material enhancing the production of AOP-1 or a material enhancing the function of AOP-1.

9. The prophylactic or therapeutic agent of claim 8, further comprising as an active ingredient a nucleic acid encoding AOP-1 or a nucleic acid encoding a polypeptide having an addition, deletion or substitution of one or more amino acids as compared with the amino acid sequence of AOP-1 while retaining the function of AOP-1.

10. The prophylactic or therapeutic agent of claim 8, further comprising as an active ingredient a material enhancing the expression of AOP-1 gene.

11. The prophylactic or therapeutic agent of claim 8, further comprising as an active ingredient a material enhancing the production of AOP-1.

12. The prophylactic or therapeutic agent of claim 11, wherein the material enhancing the production of AOP-1 is a nucleic acid encoding AOP-1 or a nucleic acid encoding a polypeptide having an addition, deletion or substitution of one or more amino acids as compared with the amino acid sequence of AOP-1 while retaining the function of AOP-1.

13. The prophylactic or therapeutic agent of claim 8, further comprising as an active ingredient a material enhancing the function of AOP-1.

14. The prophylactic or therapeutic agent of claim 8, wherein the disease associated with decreased expression of AOP-1 gene or AOP-1 comprises chronic heart failure, ischemic heart failure, ischemic heart disease, rheumatoid arthritis, neurodegenerative disease, hepatic disease or renal failure.

15. A diagnostic method for a disease associated with decreased expression of AOP-1 gene or AOP-1, comprising determining the expression level of AOP-1 gene or the production level of AOP-1 to make a diagnosis based on the expression level or production level.

16. The diagnostic method of claim 15, wherein the disease associated with decreased expression of AOP-1 gene or AOP-1 comprises chronic heart failure, ischemic heart failure, ischemic heart disease, rheumatoid arthritis, neurodegenerative disease, hepatic disease or renal failure.

17. A diagnostic agent or diagnostic kit for a disease associated with decreased expression of AOP-1 gene or AOP-1, comprising a means for determining the expression level of AOP-1 gene or the production level of AOP-1 as a measure.

18. The diagnostic agent or diagnostic kit of claim 17, wherein the disease associated with decreased expression of AOP-1 gene or AOP-1 comprises chronic heart failure, ischemic heart failure, ischemic heart disease, rheumatoid arthritis, neurodegenerative disease, hepatic disease or renal failure.

19. A non-human transgenic animal suitable for use as a pathologic model of a disease associated with decreased expression of AOP-1 gene or AOP-1 wherein the production of AOP-1 is suppressed or the expression of AOP-1 gene is suppressed or AOP-1 gene is deleted.

20. The non-human transgenic animal of claim 19, wherein the disease associated with decreased expression of AOP-1 gene or AOP-1 comprises chronic heart failure, ischemic

heart failure, ischemic heart disease, rheumatoid arthritis, neurodegenerative disease, hepatic disease or renal failure.

21. A transformed tissue or transformed cell suitable for use as a tissue model or a cell model of a disease associated with decreased expression of AOP-1 gene or AOP-1 wherein the production of AOP-1 is suppressed or the expression of AOP-1 gene is suppressed or AOP-1 gene is deleted.

22. The transformed tissue or transformed cell of claim 21, wherein the disease associated with decreased expression of AOP-1 gene or AOP-1 comprises chronic heart failure, ischemic heart failure, ischemic heart disease, rheumatoid arthritis, neurodegenerative disease, hepatic disease or renal failure.

23. A method for screening a material enhancing the expression of AOP-1 gene, a material enhancing the production of AOP-1, a material enhancing the function of AOP-1, or a combination thereof, comprising administering or adding a synthesized or genetically engineered material or a natural material or a derivative thereof to the non-human transgenic animal or transformed tissue or transformed cell of claim 18 to detect the expression level of AOP-1 gene or the production level of AOP-1.

24. A method for screening a material enhancing the expression of AOP-1 gene, a material enhancing the production of AOP-1, a material enhancing the function of AOP-1, or a combination thereof, comprising contacting a synthesized or genetically engineered material or a natural material or a derivative thereof with (1) a transformed cell or an in vitro expression system having a transcriptional regulatory region of AOP-1 gene and AOP-1 gene or a reporter gene to detect the expression level of AOP-1 gene or the reporter gene or with (2) AOP-1 or a target molecule of AOP-1 to detect the amount of AOP-1 or the target molecule of AOP-1.

25. The screening method of claim 24, further comprising constructing an expression

vector having a transcriptional regulatory region of AOP-1 gene linked upstream or downstream of the translation region of a reporter gene, then culturing a suitable host cell transfected with said vector, adding a synthesized or genetically engineered material or a natural material or a derivative thereof to the cultured cell and detecting changes in the expression level of the reporter gene or the production level of the reporter protein after a given period.

26. The screening method of claim 24, further comprising contacting a synthesized or genetically engineered material or a natural material or a derivative thereof with AOP-1 or a target molecule of AOP-1 to detect the amount of AOP-1 or the target molecule of AOP-1 bound or unbound to said material.

27. The screening method of claim 24, further comprising immobilizing AOP-1 or a target molecule of AOP-1 on a substrate and adding a synthesized or genetically engineered material or a natural material or a derivative thereof and AOP-1 or target molecule of AOP-1 to the immobilized AOP-1 or target molecule of AOP-1 to detect the amount of AOP-1 or the target molecule of AOP-1 bound or unbound.

28. The screening method of claim 24, further comprising immobilizing a synthesized or genetically engineered material or a natural material or a derivative thereof on a substrate and adding AOP-1 or a target molecule of AOP-1 to the immobilized material to detect the amount of AOP-1 or the target molecule of AOP-1 bound or unbound.

29. A method for screening a material enhancing the function of AOP-1, comprising contacting a synthesized or genetically engineered material or a natural material or a derivative thereof with AOP-1 or a target molecule of AOP-1 to determine the antioxidant or peroxynitrite scavenging activity of AOP-1.

30. The screening method of claim 29, further comprising adding a synthesized or genetically engineered material or a natural material or a derivative thereof and AOP-1 or a



target molecule of AOP-1 to AOP-1 or the target molecule of AOP-1 to determine the antioxidant or peroxynitrite scavenging activity of AOP-1.

31. The screening method of claim 29, further comprising immobilizing AOP-1 or a target molecule of AOP-1 on a substrate and adding a synthesized or genetically engineered material or a natural material or a derivative thereof and AOP-1 or the target molecule of AOP-1 to the immobilized AOP-1 or target molecule of AOP-1 to determine the antioxidant or peroxynitrite scavenging activity of AOP-1.

32. The screening method of claim 29, further comprising immobilizing a synthesized or genetically engineered material or a natural material or a derivative thereof on a substrate and adding AOP-1 or a target molecule of AOP-1 to the immobilized material to determine the antioxidant or peroxynitrite scavenging activity of AOP-1.